We Claim:

1. An implantable pulse generator (IPG) system limiting undesired current flow comprising in combination:

(a) an IPG housing

(b) a signal generator disposed in the housing that generates an electrical signal;

(c) at least one lead extending from the housing and in electrical communication with the signal generator, wherein the lead conveys the electrical signal to electrically sensitive tissue;

(d) current limiting componentry within the IPG case comprising at least one capacitive element electrically coupled to at least one lead; and

(e) at least one impedance increasing element serially coupled between the capacitive element and an electrical ground, wherein the capacitive element together with the impedance increasing element provides an alternating current impedance path to the electrical ground from a lead coupled to the capacitive element.

2. The IPG system of claim 1, further comprising:

(f) a first switching device coupled between the capacitive element and the electrical ground.

3. The IPG system of claim 2, further comprising:

(g) a signal sensor for sensing an external signal, wherein the signal sensor is coupled to the first switching device and wherein the signal sensor disables the first switching device when the sensor senses that a level of the external signal is greater than an external signal threshold.

4. The IPG system of claim 3, wherein the sensor comprises a telemetry antenna.

5. The IPG system of claim 3, wherein the sensor comprises a coil/transformer.

6. The IPG system of claim 3, wherein the sensor comprises a lead voltage sensor.

7. The IPG system of claim 3, wherein the sensor comprises a lead current sensor.

8. The IPG system of claim 3, wherein the sensor comprises a sensor for sensing a magnetic field effect.

9. The IPG system of claim 3, wherein the sensor comprises a Hall effect sensor.

10. The IPG system of claim 1, further comprising:

(f) a second switching device coupled between the capacitive element and the

impedance increasing element.

11. The IPG system of claim 10, further comprising:

(g) a signal sensor for sensing an external signal, wherein the signal sensor is coupled to the second switching device and wherein the signal sensor enables the second switching device when the sensor senses that a level of the external signal is greater than an external signal threshold.

12. The IPG system of claim 11, wherein the sensor comprises a telemetry antenna.

13. The IPG system of claim 11, wherein the sensor comprises a coil/transformer.

14. The IPG system of claim 11, wherein the sensor comprises a lead voltage sensor.

15. The IPG system of claim 11, wherein the sensor comprises a lead current sensor.

16. The IPG system of claim 11, wherein the sensor comprises a sensor for sensing a magnetic field effect.

17. The IPG system of claim 11, wherein the sensor comprises a Hall effect sensor.

18. The IPG system of claim 1, wherein the impedance increasing element is a capacitive element that reduces the capacitance and increases the impedance of each alternating current impedance path.

19. The IPG system of claim 1, wherein the capacitive element is a feedthrough capacitor.

20. The IPG system of claim 1, further comprising at least one alternating current blocking element, wherein the alternating current blocking element is coupled between the capacitive element and a distal end of the lead coupled to the capacitive element.

21. The IPG system of claim 20, wherein the alternating current blocking element comprises an inductive element.

22. The IPG system of claim 20, wherein the alternating current blocking element comprises a ferrite bead.

23. The IPG system of claim 20, wherein the alternating current blocking element comprises a resistor.

24. The IPG system of claim 1, further comprising at least one resistor, wherein the

resistor is coupled between the capacitive element and a distal end of the lead coupled to the capacitive element.

25. An implantable pulse generator (IPG) system limiting undesired current flow comprising in combination:

(a) an IPG housing

(b) a signal generator disposed in the housing that generates an electrical signal;

(c) at least one lead extending from the housing and in electrical communication with the signal generator, wherein the lead conveys the electrical signal to electrically sensitive tissue;

(d) current limiting componentry within the IPG case comprising at least one capacitive element electrically coupled to at least one lead; and

(e) at least one alternating current blocking element, wherein the alternating current blocking element is coupled between the capacitive element and a distal end of the lead coupled to the capacitive element.

26. The IPG system of claim 25, wherein the alternating current blocking element comprises an inductive element.

27. The IPG system of claim 25, wherein the alternating current blocking element

comprises a ferrite bead.

28. The IPG system of claim 25, wherein the alternating current blocking element comprises a resistor.

29. The IPG system of claim 25, further comprising at least one resistor, wherein the resistor is coupled between the capacitive element and a distal end of the lead coupled to the capacitive element.

30. The medical device of claim 25, wherein each capacitive element of the plurality of capacitive elements is a feedthrough capacitor.

31. An implantable medical device for application of an electrical signal to electrically sensitive tissue and capable of limiting undesired current flow, the medical device comprising in combination:

(a) a housing;

(b) a signal generator disposed in the housing that generates the electrical signal;

(c) a plurality of leads extending from the housing and in electrical communication with the signal generator, wherein at least one lead of the plurality of leads applies the electrical signal to the electrically sensitive

tissue;

(d) a plurality of capacitive elements, wherein each capacitive element of the plurality of capacitive elements is associated with a lead of the plurality of leads;

(e) an impedance increasing element serially coupled between each of the plurality of capacitive elements and an electrical ground, wherein each capacitive element together with the impedance increasing element provides an alternating current impedance path to the electrical ground from a lead coupled to the capacitive element;

(f) a first switching device coupled between each capacitive element of the plurality of capacitive elements and the electrical ground;

(g) a second switching device coupled between each capacitive element of the plurality of capacitive elements and the impedance increasing element; and

(h) a signal sensor for sensing an external signal, wherein the signal sensor is coupled to each of the first switching device and the second switching device and wherein the signal sensor disables the first switching device and enables the second switching device when the sensor senses that a level of the external signal is greater than an external signal threshold.

32. An implantable medical device for application of an electrical signal to electrically sensitive tissue, wherein the medical device is capable of operating in both a

unipolar mode and a bipolar mode, the medical device comprising:

(a) a housing;

(b) a signal generator disposed in the housing that generates the electrical signal;

(c) a lead extending from the housing and in electrical communication with the signal generator, wherein the lead conveys the electrical signal to the electrically sensitive tissue;

(d) a switching device disposed in the housing and coupled to an electrical ground, wherein activation and deactivation of the switching device causes the medical device to switch between a unipolar mode of operation and a bipolar mode of operation; and

(e) a signal sensor for sensing an external signal, wherein the signal sensor is coupled to the switching device, and wherein the signal sensor causes the switching device to convert the medical device from a unipolar mode of operation to a bipolar mode of operation when the sensor senses that a level of the external signal is greater than an external signal threshold.

33. The medical device of claim 32, wherein a non-conducting state of the switching device corresponds to a bipolar mode of operation of the medical device and a conducting state of the switching device corresponds to a unipolar mode of operation of the medical device.

34. The medical device of claim 32, wherein the external signal threshold comprises a current threshold, and wherein the sensor causes the switching device to enter a nonconducting state when the sensor senses that a level of undesired current in the lead exceeds the external signal threshold.

35. An implantable medical device for application of an electrical signal to electrically sensitive tissue, the medical device comprising:

(a) a housing;

(b) a signal generator disposed in the housing that generates the electrical signal; and

(c) a lead extending from the housing and in electrical communication with the signal generator, wherein the lead comprises a plurality of electrical conductors that each extend from a proximal section of the lead to a distal section of the lead, wherein a first electrical conductor of the plurality of electrical conductors is coupled to the signal generator, and wherein a second electrical conductor of the plurality of electrical conductors is coupled to a electrical ground,

wherein, when an alternating current is externally induced in the first electrical conductor, a portion of the alternating current is coupled to the electrical ground via the second electrical conductor.

36. An implantable medical device for application of an electrical signal to electrically sensitive tissue, the medical device comprising:

(a) a housing having a plurality of output ports:

(b) a signal generator disposed in the housing that generates the electrical signal; and

(c) a plurality of leads, wherein a proximal end of each lead of the plurality of leads extends from an output port of the plurality of output ports, wherein a distal end of each lead is coupled to an electrode, wherein a first lead of the plurality of leads is in electrical communication with the signal generator and conveys the electrical signal to the electrically sensitive tissue, wherein a second lead of the plurality of leads is coupled to a electrical ground,

wherein when an alternating current is externally induced in the first lead, a portion of the alternating current is coupled to the electrical ground via the second lead.

37. A method for limiting the application of an externally induced current to an implantable medical device, the method comprising steps of:

(a) sensing an external signal;

(b) comparing the external signal to a signal threshold; and

(c) converting the medical device from a unipolar mode of operation to a bipolar mode of operation when the external signal compares unfavorably with the signal threshold.

38. The method of claim 37, wherein the step of converting comprises a step of enabling a switching device when the external signal compares unfavorably with the signal threshold, and wherein a unipolar mode of operation corresponds to an enabled switching device and a bipolar mode of operation corresponds to a disabled switching device.

39. A method for limiting the application of an externally induced current to an implantable medical device, the method comprising steps of:

(a) sensing an external signal;

(b) comparing the external signal to a signal threshold; and

(c) switching an impedance increasing element serially into an impedance path of the external signal when the external signal compares unfavorably with a signal threshold.

40. A method for limiting the application of an externally induced current to an implantable medical device, wherein the medical device comprises internal circuitry, a lead extending from the medical device, and a switching device coupled between the lead

and the internal circuitry, the method comprising steps of:

(a) sensing an external signal;

(b) comparing the external signal to a signal threshold; and

(c) disabling the switching device when the external signal compares unfavorably with a signal threshold.